THE

VETERINARY JOURNAL

Editor:

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PROFESSOR CHAUVEAU.

THE death of Professor Chauveau has removed from the veterinary profession of the whole world a wonderful man, and one who, although in his 90th year, had still opinions which were listened to with respect.

Born in 1827, he graduated from the Alfort School, and at the same time became a member of the Faculty of Medicine of Paris, being elected on the staff of the Lyons Veterinary School almost immediately, and as Director of the School in 1875. He was a member of the Institute at the Academy of Sciences, the Society of Biology, and a regular attendant at the meetings of the French Academy of Medicine.

In the veterinary world of France he was appointed Inspector-General of the Veterinary Sciences, and his work on the subjects of physiology and pathology gained him the Professorship of Comparative Pathology at the National Museum of Paris, where he eventually built an institute devoted entirely to the study of comparative work.

Chauveau was one of the original founders of the "Journal de Physiologie et de Pathologie Général," and the author of many valuable works, of which his "Comparative Anatomy" will be the most familiar to the British.

In the physiological study of the living heart he made standard researches in conjunction with M. Morey, and much valuable knowledge was given to the world through the methods they devised.

His whole life was one of the greatest energy, and the results of his valuable researches did much to elucidate many valuable points about which there had been doubt. The pity of it is that such men must die. His work, however, can never be forgotten, as it forms a platform upon which many edifices will in time be raised. He was indeed a giant in his generation.

Editorial.

THE HORSE BREEDING QUESTION.

It has been generally conceded that the horse stock of the United Kingdom is the finest in Europe, if not in the world. The brains and energy shown in bringing it up to its high pitch are apt to be forgotten by those living in present times, and there is a tendency to believe that the best equines exist here naturally, and will continue to arrive quite regularly, and methodically, without much effort on our part. What we fancy will come easily and as a matter of course we are liable to manage wastefully when it arrives. We frequently overlook the help that science can give to nature's part in production; the value its application may bring to the health and conservation of animal life; the guiding stars in hazy regions that its records will prove to be. The truth is, there has never been that thoroughness in the knowledge of horse breeding matters which there ought to have been in a land blessed as ours is with the best of foundation stock. Breeders can tell you how many mares their stallion jumped, and some of them can rattle off who was the sire and dam of many a high-born foal; but not one out of fifty can tell you how many live foals his stallion begat, or how those foals turned out as regards shape and constitution. Everything to the breeder is for the best in the best of all possible worlds, if his sire becomes a financial success; but finance in one corner of animal life only is but a foul spectre and an illusory shadow exerting a deleterious and unwholesome influence on the whole and complete field and aim of horse breeding. It is a crying omission on our part that records of deep knowledge and wisdom in reproductive operations do not exist in profusion in the archives of our land. We have had chances innumerable of collecting and collating the material, but we have been unworthy drones in the matter, and our record offices remain empty, dank, and musty. It is true that the Board of Agriculture have a return of percentage of foals for all horses having Government grants; but this, however valuable, only skims over the surface of things as affecting horse-breeding in its entirety.

We ought to know all about the best care and nourishment of the sire in the breeding season, and their influence on potency and the energy of the spermatozoa, the faults of nourishment and oestrum which hinder ovulation and make fruitfulness difficult, the number of mares a good stallion ought to make pregnant, and the number of living foals these pregnant mares ought to produce. A debatable point in the science of breeding is how soon after one jump a second

should be given. The influence of soil and surroundings on reproduction should be noted, and the number of male and female progeny produced be recorded. Some more light might be thrown on the causes of abortion in mares, and why with individual dams the foals almost invariably die during the act of parturition.

The light horse breeding question seems to be somewhat up in the air at present, but there ought to be no hesitancy or uncertainty about the increase of heavy horse production. We know the worst as to the inroads of motor vehicles on city and town practice. Motor tractors may decrease somewhat the number of horses on the farm; but it may be recollected by country practitioners for their comfort that the buying of a farm tractor does not lower the cost of working the holding, and it must produce increased returns to justify its existence. Again, in a country with much damp loam like ours, tractors are increasingly difficult to operate owing to the packing and clogging of the soil. The increased use of heavy horses for Army purposes ought to overbalance any decline in their employment due to motor farm implements.

In conclusion, we may state how very pleased we were to read a copy of a resolution recently passed by the N.W. Anglesey Shire Horse Society, and sent by them to the Shire Horse Society and other local societies. It is only a resolution that will cause a ripple on the placid surface of things, but it shows that the heart and head of the Anglesey Society are in the right place, and perhaps it will induce other societies to originate many deeper and more depth disturbing waves. This is the resolution :—

> "That it would be a great advantage to Shire horse breeders generally, and to affiliated societies, if your Society would devise a scheme for obtaining a reliable return of mares served and foals produced each season by registered stallions hired out to various districts, and that a register of those returns be kept by the Secretary, so that every society or member might on application (on payment of a small fee) obtain the information required from him. and be in a position to judge of the foal-getting capacity of the horses." G. M.

OUR 500TH NUMBER.

WITH this number we complete our 500th issue, so that for over forty years we have given food for consideration and thought to the members of the veterinary profession. With the kind help of numerous contributors we have been able to keep the stream of veterinary science flowing merrily on. To those sending us contributions from the zones of military operations we are doubly thankful. Our gratitude is

especially due to all those who are rallying round us now. It was never more difficult to conduct a journal, from the editorial and publisher's points of view, than it is at the present time. We hope our contributors will continue to assist us by sending in case reports and items of interest of all kinds. We want the boys to have something profitable and instructive to read whilst on active service and when they come home, so that they may recognise that those of us too old or feeble to fight or campaign are doing what we can to keep the flag of veterinary science flying while they are helping to protect our homes and practices.

WE think it will interest our readers on this occasion to know the names of those who have acted as editors of the VETERINARY JOURNAL from its inception up to the present day.

The VETERINARY JOURNAL first made its appearance in 1875, under the editorship of George Fleming, C.B., LL.D., F.R.C.V.S., Veterinary Surgeon, 2nd Life Guards, who, it will be remembered, subsequently became Principal Veterinary Surgeon of the British Army with the rank of General. On his death, in 1894, he was succeeded by William Williams, F.R.C.V.S., F.R.S.E., Principal of the Royal Veterinary College, Edinburgh. In January, 1900, Professor Owen Williams, F.R.C.V.S., F.R.S.E., became sub-editor under his father, and when the latter died in November of the same year, his son took over the whole editorial responsibility. He subsequently moved to Liverpool, where he took an important share in founding the Veterinary Department at the University. In 1903, Colonel J. A. Nunn, C.B., D.S.O., F.R.C.V.S., F.R.S.E., Army Veterinary Department, joined him as sub-editor. When Owen Williams died in January, 1905, he was succeeded by Frederick Hobday, F.R.C.V.S., F.R.S.E. (now Major in the A.V.C.), who still edits the journal.

On the death of Colonel Nunn, in 1908, Professor G. H. Wooldridge, F.R.C.V.S., was appointed sub-editor, in which post he remained for several years.

In September, 1906, Mr. W. L. Williams, V.S., Professor of Surgery and Obstetrics in the New York State Veterinary College, joined the Editorial Staff as Editor for the United States. In January, 1910, Mr. J. A. Gilruth, M.R.C.V.S., F.R.S.E., Dean of the Veterinary Faculty, University of Melbourne, became Editor for Australasia, and Dr. Williams relinquished his post. In September, 1912, Professor Gilruth ceased to be on the Editorial Staff and the editorship of the Australian Supplement was undertaken by Professor H. A. Woodruff (now Major in the A.V.C.). In December, 1913, Professor Wooldridge resigned his position as Sub-editor, from which date Major Hobday has been in sole charge of the editorship of the journal. While on Active Service with the British Expeditionary Force in France, Major Hobday is being assisted in the editorship by Mr. Gladstone Mayall, M.R.C.V.S., of Bolton.

OUR readers will be glad to hear that among the names mentioned in Sir Douglas Haig's recent despatch that of our editor, Major F. T. G. Hobday, F.R.C.V.S., appears, in token of distinguished gallant and service and devotion to duty.

Clinical Cases: Army Veterinary Service.

AN INTERESTING CASE OF EVERSION OF THE UTERUS IN A COW, ACCOMPANIED BY MILK FEVER.

By MAJOR FREDERICK HOBDAY and CAPTAIN J. F. PLAYER.
Army Veterinary Corps.

Owing to the absence of the veterinary surgeons of France on war duties, it is quite the usual thing for the British veterinary officer to be asked by the French farmer for assistance when it is needed, and by courtesy of those in high authority permission is given to render them help as far as lies in their power.

The French farmer is generally a very good fellow at heart, and will lend his tools or render assistance generally as far as lies in his power, so that for this alone he deserves a ***quid pro quo.***

The patient on this occasion was a very nice Normandy cow, this being her fourth calf. The messenger who came for help stated that she was lying down on the ground, and appeared to be very ill and in great pain.

When we got there we found that the animal was only partly conscious. It was then about 11 o'clock p.m. She was very uneasy, and would not stand up for long at a time. The whole of the uterus and afterbirth attached was outside the vagina, and had become soiled on the cowbyre floor.

We both stripped for the job, and speedily obtained some hot water and disinfectant, washed the inverted uterus, removed the cleansing, and endeavoured to replace it. As she strained very violently, a tracheotomy tube was inserted, this causing an improvement at once.

Retroversion was eventually accomplished about 12.30 a.m., by which time she had again gone down, being quite unconscious, and showing all the symptoms of milk fever.

We obtained a clean, silver-plated teat siphon (most French farmers are educated to keep such things at hand), and with the aid of a bicycle pump the udder was inflated with air. Tapes were applied for half an hour to the teats, and the animal made comfortable for the night. This treatment was repeated twice, and the cow rapidly recovered consciousness, eventually making a most excellent recovery. A canvas and rope truss was put on, tapes also being inserted across the vulva, and these were removed on the second day afterwards.

AN INTERESTING SHRAPNEL INJURY.

By LIEUTENANT J. A. MATHESON,
Army Veterinary Corps.

THE subject from which the photograph was taken was a bay gelding, heavy draught, evacuated to hospital with a shrapnel wound on the near side of the neck about the middle third.

There was considerable pain when the neck was manipulated, and also when attempting to feed off the ground.

Examination in the standing posture caused such pain that the animal was cast and chloroformed, after which a probe revealed that there was a foreign body there, and that the bone was fractured.

Photograph showing position of the Shrapnel Bullet.

With the finger a bullet could be felt firmly embedded in the bone, but all my efforts to remove it were unavailing, and the patient was destroyed.

Post-mortem examination revealed a shrapnel bullet which had become lodged in the body of the third cervical vertebra, and fractured it into several splinters. Had the patient recovered, anchylosis, and a consequent stiff neck must inevitably have been the result.

BACTERIAL NECROSIS IN THE HORSE.

By CAPTAIN E. F. STEEVENSON.
Army Veterinary Corps.

THE following are a few notes, which I made while in France during the latter part of 1914 (October to December) and in 1915, on the above disease in a large number of cases of which occurred in the horses under my veterinary charge.

The disease occurred as a Gangrenous Dermatitis affecting principally the heels, coronets, and frogs, and occasionally as necrosis affecting the tongues and gums of horses. It also occurs in other situations—*e.g.* above and around the fetlocks and even above the knees and hocks, and apparently it may occur anywhere. A few cases also occurred in mules, but this animal appears to be much more resistant to the disease, and I never saw a very severe case.

Causes.—The actual cause appears to be the Necrosis Bacillus (Schmoll's Bacillus), accompanied by other "accidental" organisms. In smear preparations of the pus obtained from lesions and sent to the London College by Capt. Beck, A.V.C., the Necrosis Bacillus was found in large numbers.

Contributing Causes.—Anything which tends to break the continuity of the skin appears to afford the necessary opportunity for the bacillus to establish itself in the tissues, and since the lower parts of the limbs are the most frequent seats of lesions, the following are some of the common causes: Abrasions, cracked heels, rope galls, abscesses at the coronet from suppurating corns or punctured feet, thrush (in frog cases), and injuries from kicks, treads, etc. In cases affecting the mouth and tongue the original injury is not always apparent, but, no doubt, occurs and may be caused by foreign bodies, irregular teeth, etc. Cold does not seem in itself to influence the occurrence of the disease, though it may lower the vitality of the parts, and so favour infection. Some of the worst cases, however, have occurred in summer.

Symptoms.—Usually the onset of the disease is sudden, and lameness is the first symptom noticed, varying from slight lameness to inability to use the affected limb. On examination, the skin over an area varying from the size of a sixpence to a five-shilling piece is hot and excessively painful, and in horses with white hairs and unpigmented skin, visibly congested, and deep red, or even purple, in colour. In white-haired legs, too, a sharp line of demarcation can usually be seen by the second day, outlining the necrotic area which is about to slough. Pressure on this area causes severe pain and the exudation of a little reddish-yellow fluid. At this stage the horse is always lame, and there is usually a bad odour, which is readily detected on the fingers after manipulating the spot. The hair is moist, and often a little pus containing shreds of necrotic tissue can be seen exuding from the edges of the lesion. The leg from the foot to the knee or hock is usually more or less swollen, and there may or may not be fever. In severe cases there is always fever, with acceleration of pulse and respirations. In from two to three days, or longer, according to the case, the piece of skin included within the outlined area sloughs, and with it a varying amount of the subjacent tissue, leaving a deep granulating sore with

ragged edges. In favourable cases lameness then disappears, and healing occurs by granulation. In unfavourable cases sloughing extends, and gangrene becmes more pronounced, and in such cases it is very difficult, and sometimes impossible, to arrest the extension of the necrosis and get the tissues to take on a healthy action. In these cases there is always a very putrid odour, and the whole region is intensely painful. If a part of a limb is affected, no weight is placed upon it unless the animal is forced to do so ; but the limb is held in the air with certain spasmodic movements, much as in cases of acute anthritis, except that as a rule the animal *can* put some weight on the limb if forced to move. (In one case affecting the inside of the hock after a kick, necrosis spread both up and down the limb until it reached half-way up the tibia and half-way down the cannon bone ; and on trying to remove the necrotic parts with the knife, the yellowish, putrid, insensitive dead tissue was found to extend right down to the hock joint and to include the perforans tendon where it passes through the tarsal sheath. The necrosis extended down to the bones of the hock and also the tibia. The whole skin surrounding the leg could be removed over a length of quite 18 inches.) The temperature varies from 101° F. to 104° F., or even higher ; breathing is accelerated ; and the pulse, at first fast and full, rather like a laminitis pulse, becomes faster and weaker. The mucous membranes are injected and dirty looking, and the animal is dull and refuses food. If the case does not improve, the animal rapidly becomes weaker, lies down a great deal, and has much difficulty in getting up, temperature rises still higher, and death occurs from toxæmia and exhaustion.

In cases affecting the sensitive frog the symptoms are similar, and a cone-shaped slough becomes detached from the plantar cushion. There is acute lameness ; but these cases usually do well.

Complications.—These include open joints and tendon sheaths, loss of a hoof due to separation (caused by the discharge) of the horny from the sensitive laminæ, quittor (which is a common complication in cases affecting the area over the lateral cartilages), oral fistula in mouth cases, exostoses of the os suffraginis and os corona in a few cases, gangrene and septicæmia.

Treatment.—Prophylaxis consists in careful drying of the heels and legs and strict attention to all wounds, cracked heels, rope galls, etc. Cracked heels should be frequently looked for, carefully dressed, and kept as dry as possible. An oily dressing or vaseline is most valuable to prevent penetration of the mud, in which the organism is abundant.

Curative Treatment.—In the early stages carefully clip the hair from the place and surrounding area and thoroughly cleanse the

region. Then apply a hot antiseptic fomentation—*e.g.* a hot bath of hydrarg. perchlor or carbolic acid, or antiseptic poultices. In cases affecting the coronet, poultices seem less liable to cause separation of the hoof than foot baths. A thick paste of kaoline (anti-phlogistine) applied hot is better still, if available. Applications of a 1–20 solution of potass. permanganate between the poultices or foot baths are very useful in removing the smell, and being an oxidising agent it is particularly indicated to combat an anærobic organism. It is necessary to cause separation of the necrotic skin and tissue as quickly as possible and as much as possible should be removed with scissors. As soon as sloughing has occurred, dress the wound with a 1–20 solution of permanganate or pure tincture of iodine, and after this the place may be treated as an open wound. Granulation should be controlled by pressure, and if necessary the use of a caustic. A double strength of "White Lotion"—*i.e.*, Lead Acetate ʒii Zinci Sulph. ʒiv to a pint of water—is very useful as an occasional dressing. In cases affecting the frog, free drainage is essential, and directly sloughing has occurred the part should be cleansed and kept as *dry* as possible. Where the lesion affects the coronet and there is swelling, it is necessary to thin the wall of the hoof, and perhaps remove a portion where the pus has burrowed under it. Pain is excessive in many cases unless the wall be thinned below the swollen area.

In cases where necrosis and sloughing continue, the actual cautery may be necessary (subcutaneous injections of hydrogen peroxide around the lesion would appear good treatment, but I had no opportunity to try it).

Complications must be treated according to the case; open joints and tendon sheaths are usually hopeless; and the continuance of fever after sloughing has occurred is a very bad sign, and indicates extension of the necrosis and gangrene.

Note.—It is a rather interesting fact that this disease has in my experience occurred just as frequently and severely in horses standing under cover in barns, etc., as in horses standing in the open and exposed to mud and cold. The disease is much commoner in winter, and especially during thaws after a frost. Several cases occurred in summer, and usually after rain. I have also seen four or five cases, one extremely severe (the horse had to be destroyed) in Mesopotamia. These latter occurred in February, 1916, during the heavy rain which fell there. The animals in which it occurred had *not* come from France, but were in a cavalry brigade which had been in the country many months.

EVERSION OF THE UTERUS IN A MARE.

By Captain A. S. FERGUSON.
Army Veterinary Corps.

Whilst attached to a battery of artillery and stationed in a French village within a few miles of the firing line I was requested by the Commanding Officer to extend the "Entente cordiale" to a French farmer by going to see his mare, which was said to be very ill.

I found the mare to be a well-bred Percheron, 5 years old, which had foaled about 12 o'clock mid-day, and had everted her uterus.

I arrived there about 2 o'clock, and at this time the whole uterus was protruding, and the cleansing attached.

The mare was restless and would not allow her temperature to be taken, but after some manipulation I removed the afterbirth and bathed the swollen parts with hot water. I had no disinfectant, and could not procure any at the time. I then got a cloth, held by a man on either side, to support the organ, and attempted to effect a retroversion. After manipulating it for about half an hour I managed to successfully return it. A plough line was fashioned as a truss, and applied.

No medicines were administered, and no antiseptics used, and she was off her feed for two days, but except for a quickened pulse she showed no symptoms to give rise to alarm, and within a week had made a good recovery.

EXPERIENCE OF A VETERINARY OFFICER DURING THE BATTLE OF THE SOMME.

About 10.0 p.m. one night, during the heavy shelling after the men had gone over the parapet in the sector in which I was stationed, I was sitting in the ruined farm-house which had constituted our mess, when news was brought to me that the transport had been shelled badly when taking up rations, and that a number of the mules had been killed and others wounded. Owing to the difficulties of getting the wagons up to the trenches, all the ammunition and food was taken up on pack-saddles the mules being divided up into isolated parties.

The party to which I was called had caught it badly, and upon arrival I found that some twenty-seven of the mules had been more or less damaged. By the light of a torch I made a rapid inspection, and at once put four of the poor brutes out of their misery with my revolver. The remainder were eventually got out of the shelling area, and patched up the next morning.

It was a horrid sight to see the havoc which had been made, as some of them had huge flesh wounds, and in all cases the animals were absolutely terrified. They had stampeded when the shells dropped amongst them, and it was only with the utmost difficulty that they had been caught again.

Original Communications.

DIAZO-REACTION.

By G. GAIR, M.R.C.V.S.,
Cononbridge.

With reference to the interesting article by Mr. Mayall on the Diazo-Reaction in equine tuberculosis, several opportunities occurred to me lately whilst acting as bacteriologist for the M.O.H. and hospitals of the County of Ross-shire of using the Diazo-Reaction in cases of tuberculosis, typhoid, fever, and heart disease in the human subject.

In all the human cases of tuberculosis examined microscopically for T.B., and in which the bacilli were obtained in the sputum, the reaction was constantly present in the urine. The reaction is always evident in typhoid fever. A particular instance happened lately in a suspected typhoid case, where I only obtained a partial clumping with the Widal test. The urine reacted, however, very strongly in the Diazo reaction. This case appeared at first to be one of tuberculosis. Having, however, put some of the urine under the 1–6th objective, the bacilli of typhoid were obtained in great numbers.

I also grew it on agar and had a vigorous growth next day, and then plated the urine on Conradi-Drigalski medium and obtained a typical growth of the organism. To differentiate it from B. Coli, or para-typhoid group, it was put through the various sugars, which showed conclusively the nature of the disease.

From the outset this case continued a mild one ; and as the Widal test is not decisive before the seventh day of fever, this may account for the result of the test exhibiting only partial clumping, along with the fact of this examination being made in the early days of the fever.

The Diazo-Reaction is obtained in the urine of typhoid patients three or four days earlier than with the Widal test. The bacilli are also found in the urine of typhoid patients at an earlier stage than that on which the Widal test can be satisfactorily applied.

The detection in the urine of human beings and animals of these pathological substances which give the Diazo-Reaction is of great clinical value in diagnosis, and especially in prognosis, in cases of tuberculosis and typhoid fever.

The diagnostic value is perhaps greater in typhoid fever than in tuberculosis : it occurs in a large percentage of typhoid fever as early as the fifth day, while its disappearance usually indicates subsidence of the disease ; a reappearance suggests a relapse. The reaction does not appear in the para-typhoid group. Should the reaction be positive, the foam of the urine shows a beautiful pink colour, and the body of the urine a crimson. These colours should not be mistaken for a reddish-brown, which develops at times, and soon disappears when the tube is set aside. When the ammonia is added by letting it run down the sides of the tube containing the urine and reagent, one should note the rings of various colours at the point of contact.

The formation of a red ring is an indispensable part of the true Ehrlich Diazo-Reaction. The pink foam in positive cases varies in intensity, depending on the strength of the reaction, from palest rose to deepest pink, but must not be any other colour, such as orange or salmon.

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A STUDY IN TOXICOLOGY.

POISONOUS VEGETABLE AGENTS—CATTLE, HORSES, ETC.

By Fred. C. Mahon, M.R.C.V.S.

Poisons Encountered Mostly in Country Practice.

The points about vegetable and mineral poisons are :—

(1) That they all contain certain definite and specific actions;

(2) That they all lie latent in the system a certain, but varying period of time before these actions are set up ; and

(3) That the phenomena resulting from their action vary in some degree according to the dose and to the receptivity of the patient.

The first law, or that of the definite and specific actions of poisons, cannot be doubted, for if it be supposed that agents acting on the human body do not produce their effects according to certain definite laws, we can neither determine the seat nor the cause of any disease, nor direct nor judge of the operation of remedies.

No one, for instance, has seen castor oil produce tetanus, or colchicum intoxicate the brain, or opium influence the spleen. The physician perfectly well knows that the first of these acts on the intestines, the second on the ligaments, and the third on the nervous system generally. The action of poisons, therefore, is not accidental, but determined by certain definite laws.

The action of poisons, though definite, is variously limited. Some poisons, for instance, act on one membrane, or one organ, or on one system of organs ; while other poisons extend their action over two or more membranes, or organs, or system of organs, or even over all the whole animal frame.

We have examples in aloes and jalap of substances that act mainly on the mucous membrane of the alimentary canal. In digitalis we have the instance of a medicine that principally acts on the heart, greatly reducing—or even stopping—its action, while strychnine is an example of a medicine, acting on the parts supplied by the spinal cord, producing painful and sometimes fatal tetanic action of every voluntary muscle of the body.

It is seldom, however, that the action of poisons is limited to one membrane, or organ, or system of organs. The greater number of these noxious agents more usually act on two or more membranes, or organs, or sets of organs. Elaterium, for instance, acts on the mucous membrane of the intestinal canal, and on the kidneys.

Tobacco nauseates the stomach, intoxicates the brain, and affects the action of the heart.

Antimony has an equally extensive range ; it includes cutaneous

perspiration, acts cathartically and emetically, and in large doses appears to cause gangrene of the lungs.

Alcohol and opium are examples of substances acting still more generally, affecting not only the action or secretion of every organ or tissue of the body, but even in some cases altering their structure. Thus alcohol, in its most limited action, has been shown to cause structural disease of the liver, of the stomach, and of the coats of the arteries. From the circumstance of these substances acting not only generally, but inducing local action, they resemble in their effects those of many morbid poisons, as that of typhus fever, of scarlet fever, of small-pox, or of syphilis.

The second law of poisons is that they lie latent in the system for a period of time, which varies in different individuals, before they set up their specific actions. Rhubarb, for instance, produces no immediate result, but lies dormant in the system for six or eight hours before its action is sensible on the bowels. Opium in the usual dose is generally thirty minutes before it subdues the brain. The convulsions of strychnine do not follow till twenty minutes after its administration; and perhaps every substance except hydrocyanic acid has a greater or less sensible period of latency.

When a medicine acts on more parts than one, a considerable space of time may elapse after it has affected one organ before it affects another. Thus digitalis frequently occasions emesis before it acts on the heart, and the action of mercury on the bowels is frequently sensible for many weeks before the gums and salivary glands are affected. The doctrine of the latency of poisons is indeed so generally admitted that the actual period has been a point on which the condemnation of a prisoner tried for manslaughter has turned in our Courts of Justice when certain poisons have been supposed to have been given.

The third great law of poisons is that their effects are modified by the dose, the temperament, and the existing state of the constitution, mentally and bodily, of the recipient. The effect of the dose in modifying the pathological phenomena of disease may be exemplified in the actions of *oxalic acid* and *arsenic*. The specific action of oxalic acid is to inflame the mucous membrane of the stomach, but to ensure this effect the dose must be limited, so that this poison may lie in the system for many hours. On the contrary, if the dose be excessive and rapidly absorbed, the poison so disorders all the functions of the three great nervous centres that life is destroyed in a few minutes.

Arsenic, likewise, is a poison which inflames and ulcerates the mucous membrane of the alimentary canal, but it requires some hours to set up its specific action, for when the dose is large it in like manner

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destroys the general irritation, and traces of morbid change of structure cannot be appreciated after death. It follows from this law that the larger the dose, or the greater the intensity of the poison, the more rapid its action, and the less the probability of finding any trace of specific lesion induced by it. In the same manner the action of specific disease poisons is also limited, some affecting one membrane, or one organ, or one system of organs.

Morbid poisons have also their periods of latency, during which they seem to lie in the system before exercising their specific action. This period of incubation is indefinite in some diseases, while in others, such as rinderpest, it is definite, producing its specific action in even seven or eight days. In addition to its action upon a membrane or organ, or upon the whole body, a specific virus has, besides poisonous effects upon the blood, the power of causing certain physical alterations in that fluid.

Andral has found that a specific cause has a tendency to destroy or reduce the quantity of fibrin in the blood, and that this defect of fibrin is the cause of the great tendency to hæmorrhage, and to that stasis or congestion so remarkable in typhus fever, scarlatina, and other specific diseases.

The facts and arguments which have been adduced prove that morbid poisons act in all instances not capriciously, but according to certain definite and specific laws, modified by the influence of climate, temperament, or the magnitude of the dose; also, that they mingle with the blood, with which they continue in latent combination a certain but varying period of time, and likewise that many of them are capable of coexisting together in the same system.

A knowledge of these facts is necessary to the proper understanding of this class of diseases, and it is to be hoped that by their application many of the difficulties which have hitherto obscured the doctrines of fever, syphilis, of hydrophobia, and of many other diseases incident to this class of morbid poisons, may be removed, and that this portion of medical science may be placed on a surer foundation, if not on a permanent basis.

After reviewing the laws which govern poisons in general, I hope, as briefly as I can, to allude to some of the commonest forms of poisoning occurring in veterinary practices from my own rather large experience, and propose leaving out mineral poisons and devoting chief attention to vegetable poisons, which subject commonly occurs in the life of country practitioners, and affords much doubt and perplexity in so many cases of illness or death in which our services are requisitioned.

Lately I have had my attention drawn to a herd of cattle of

varying ages—from cows 5 and 6 years old, down to calves 6 months old —the chief symptoms presented being a dry cough, staring coat, loss of flesh, diarrhœa, constipation, haggard countenances. I was informed one calt had died, and that malicious administration of some agent had occurred.

After gathering all the information I could from the intelligent owner, I adopted what the late J. H. Steel, in his work on the Ox, lays down, and quote him on this occasion : " When called in to a case of supposed poisoning of animals out at pasture, the practitioner must set about the enquiry with an entirely unprejudiced mind. He will often find that the outbreak is one of an anthracoid nature, or other enzootic disease, not due to poison properly so-called."

It is in a case of this kind that the scientific practitioner finds the value of a knowledge of botany. When called in to put a stop to some unusual fatality in a flock or herd, after duly recording the history of the outbreak, the symptoms, *post-mortem* appearances, and general treatment of the animals, he should direct his attention to the nature of the pasturage. Careful inspection of the field, or fields, is necessary, for the growth of some plants, sometimes in small spots, and even one individual plant may destroy a herd. The general and special nature of the flora must be examined, all known plants being duly noted, all unknown plants suspected and investigated. The hedges, trees, and substances around the field, and which are accessible to the occupant, must be observed, and the general character of the ground —as nature of the soil, elevation, irregularities, also the kinds of manure which have been used to it, must not escape notice.

In observing the *post-mortem* appearances we must carefully examine the position of the animal, the state of *rigor mortis;* also the tendency to putrefactive changes in relation to the length of time which has existed since death. The conditions of the surface of the body as indicating an easy death, or the reverse, should be noted, and the markings of the animal for the purposes of identification. Notice particularly any smell arising from the ingesta. The stomach, intestines, and bladder should be put aside, and in a closed vessel, for chemical analysis ; and also portions of the walls of the stomach, of bowels, and liver, as in these very often traces of poison will be found. The complexity of these processes generally renders the opinion of an expert desirable, if any importance is to be attached to the case. Be careful, also, to see in such cases none of the ingesta or viscera come within reach of pigs or dogs, especially on the farm or in stables.

I take it that the following are the chief narcotico-vegetable poisons encountered in Great Britain, and I have experienced such cases in

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some districts more than others. As before remarked, some species exist but sparsely in some counties and in others are prolific.

1. Digitalis (Fox Glove). The root, leaves, and seeds are the most active parts; in improper doses it is a deadly poison, owing its activity to the powerfully bitter, poisonous alkaloid "Digataline." 2. Adenis Autumnalis (Pheasant's Eye). 3. Delphinium (Larkspur). 4. Poppy. 5. Hyoscyamus. 6. Bella Donna. 7. Solanum Dulcamara (Woody Nightshade or Bittersweet). 8. Hellebore. 9. Conium Maculatum (Hemlock). 10. Colchicum Autumnalis. 11. Yew. 12. Laburnum. 13. Anemone Pulsatilla. 14. Mercurialis Annua. 15. Mercurialis Perennis. 16. Ranunculi. 17. Bryony. 18. Rhododendron. 19. Veratrum Album. 20. Hellebore Niger. 21. Hellebore Fœtidus. 22. Cicuta Virosa (Water Hemlock). 23. Acorns. 24. Ferns. 25. Oak Shoots.

These are the chief offending agents—or, at least, have been broadly considered so in my experience. There are, exclusive of these plants, the fungi, of which few, fortunately, are poisonous to cattle or other animals, and the Ergot of Rye ("Claviceps Purpurea").

Generally speaking, the chief poisonous plants one encounters in low-lying, marshy, and ill-drained land are the "Poisonous Umbelliferæ," the toxic properties of which are due to the presence of a narcotic, acrid fluid, and seem to vary according to the nature of the soil and climate; for, as Dr. Christison has noticed, certain species which are generally regarded as poisonous are quite harmless when obtained from some localities near Edinburgh. This is a very important point, and one which requires further investigation. Should it prove to be true in all cases, it would probably account in a great degree for the varying strength of the official preparations of hemlock, which is commonly believed to arise from their careless preparation.

The chief umbelliferæ I have seen fatal and detrimental results from are: (1) Aenanthe Cynapium ("Fool's Parsley") is a very common indigenous plant, possessing poisonous properties; the leaves have been mistaken very often for those of parsley. (2) Aenanthe Crocata (Hemlock, Drop-Wort) are extremely poisonous in most localities. The roots also of Aenanthe Pimpillenaides, as already noticed, are said to be wholesome.

All the above species are indigenous. Cicuta Virosa (Water Hemlock or Cowbane) is another indigenous plant of a highly poisonous nature. Conium Maculatum, a native of America, has very poisonous roots, which, from having been mistaken for other harmless umbelliferæ, have not infrequently led to fatal results.

Next come in matter of urgency, although less commonly brought to our nōtice, rhododendron poisoning, attributable to ill-kept fences

and by cattle straying into parks and eating of same. I have recently encountered a severe outbreak of supposed malicious poisoning, but on careful examination and detection of the herd eating in the coverts where the plants were growing luxuriantly, together with a *post-mortem* examination on a 6 months old calf, where the leaves and young shoots were found in the rumen and abomasum in large quantity, pointed to this plant as being the cause of death from gastro enteritis. There are also cases (2) where indigestion, lassitude, debility, marasmus, diarrhœa, with irregular cardiac beat, sunken eyes, salivation, and low temperature were the most marked symptoms; and where olive oil, with nux vomica, iron, gentian, and aniseed powders, and electuaries of the same, housing, isolation, warmth, and occasional stimulants brought relief in five weeks, the calf, 8 months old, gradually gaining flesh, losing the haggard look, and bids fair to recover. Cases 3 and 4: 6 months old heifer and bull calf. These are but skin and bone, and were the last found in the rhododendron plantation, and showed primarily all the lesions met with in case (2). The properties and uses of the order "Rhododendreæ" are chiefly remarkable for their astringent properties; others are narcotic, and in some cases even poisonous. Especially is this the case with (1) Kalmia Trifolia, (2) Rhododendron Chrysanthemum, (3) Azalia Pontica. The fruits, however, of many are edible. The species of Erica, Rhododendron, Kalmia, Azalia, etc., are largely cultivated in this country, on account of the beauty of their flowers.

(1) Andromedia Floribunda, a shrub of North America, is by all accounts a deadly poison. In 1866 a number of sheep were poisoned by eating of it, but nineteen out of thirty-seven recovered under judicious treatment.

(2) Azalia Pontica (Trebizond Honey) owes its poisonous properties to the bees feeding on the flowers of this plant. Xenophon mentions the poisonous nature of this honey in his account of the "Retreat of the 1,000."

(3) Gualtheria Procumbens (Partridge Berry): The leaves possess aromatic, astringent and stimulant properties, which they owe to a volatile oil and tannic acid. The oil is known by the name of Partridge Berry or Oil of Wintergreen, and is used as a local stimulant with success in rheumatism. This plant, however, has not proved injurious to cattle feeding on it.

Nextly, Aconite (Aconitum Napellus), Monkshood: The leaves and flowering tops of the plant, also the root, especially the latter, are poisonous. I once encountered two deaths from this plant, and in sheep; others suffered from dyspnœa, skin cold, clammy, blanching of mucous membranes, giddiness, staggering walk. These recovered

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by dosing with whisky and strychnine sulphate hypodermically (1885).

Belladonna (Deadly Nightshade). I have only recognised toxic symptoms in a horse ; never definitely in cattle.

Then as to Veratrum Album (White Hellebore) : This is a narcotic, acrid poison, and is occasionally the cause of death in cattle.

The Yew order (Taxaceæ). The common yew produces extremely durable and valuable timber. Its leaves and young branches act as narcotico-acrid poisons, both in the human subject and other animals ; but it would seem to be most injurious to horses and cows. It is also frequently said that animals may feed upon the young, growing shoots, and, left upon the ground for a short time, they are then poisonous. This notion is, however, altogether erroneous, for the shoots are poisonous in all conditions. We believe that the pulp surrounding the seed is harmless, but that the seed itself is poisonous. Yew leaves and seeds (berries) have been given medicinally for their emenagogue action, sedative, and anti-spasmodic effects. According to Doctor Taylor, yew tree tea is sometimes taken to produce abortion. In cattle I have encountered several cases where abortion in the cow could be referred to its being eaten of in large quantities.

Of the N. Order (Ranunculaccæ) we have two irritant plants, eaten in quantity sufficient to produce toxic symptoms—viz., Ranunculus Seleratus and Ranunculus Flammula.

Arum Maculatum (Wake Robin, Cuckoo Pint, or Lords and Ladies), a common plant, and the source of the so-called Portland Sage or Arrowroot. Formerly the tubers were used medicinally as diuretics and expectorants ; when fresh they act as irritant poisons. (Cattle and Horses.)

Conium Maculatum (Hemlock).—This plant is indigenous ; it has been for a long time official in the Pharmacopeia, but in proper doses it is extensively employed as a medicine to relieve pain, relax spasm and compose nervous irritation in general. It owes its properties chiefly to a colourless oily liquid, with a penetrating, mouse-like odour to which the name Conia has been given I have on many occasions derived marked benefit in its use for colic in the horse.

Hemlock, and its alkaloid conine, paralyses the motor centres of the corpora striata, afterwards of the cord (Dr. Harley). Poisonous doses paralyse the muscles of respiration, and kill by asphyxia. Medicinal doses are motor depressants, and hence are anti-spasmodic and anodyne in doses of fluid ounces of the succus 2 to 4.

Conine, the volatile oily alkaloid of hemlock, is a very powerful poison, scarcely inferior to that of prussic acid.

White Hellebore (Veratrum Album).—This active vegetable is

variously estimated. Mr. Percival cherished it as a valuable sedative and active nauseant given in doses of a scruple or ½ drachm every four, six, or eight hours. Mr. Vonalt also praised it much for its soothing action in internal administration. We have also used it with very beneficial results; but in verification of the old proverb that doctors will differ we are told that Mr. Sewell held it in slight estimation; it has, however, crept into pretty general practice. (Blaine's Outline Veterinary Art, 1865.) He adds that as the horse was not intended to vomit, so it is exceedingly difficult to excite nausea in him. Aloes have been used for that purpose, but they are uncertain. We are therefore forced to trust to the powdered root of the White Hellebore, which is, perhaps, the most certain nauseant with us, but requires, as he adds, careful watching. It may be given to a certain point, and nothing but moderate nausea is observed; if pushed beyond this the head droops in the manger, the mouth slavers, the pulse sinks, the horse rocks to and fro, and purging comes on, which commonly proves a fatal symptom. Hellebore lowers the system more speedily than digitalis, but digitalis more safely when there is time for operation—at least, so we have found. It is for the observant veterinarian so select the proper cases for both.

Reviewing cattle and sheep, the magnitude of the quadrilateral ttomach, the large proportion of food which it always contains, and the comparatively low vascularity and sensibility of the whole alimentary canal, account for the tardy, uncertain action of many purgatives. Hence arises the question of administration of purgatives in cases of poisoning. For these ruminants saline purgatives are preferable, and their action may be materially expedited by the encouraging of drinking of water. Here again, in cases of poisoning, water is best avoided. Many deaths from yew are probably hastened by the animal drinking water. This has been my experience of many cases I saw, as remote as 1885, at Exeter, Devon.

The peculiarity of the action of medicines in cattle is chiefly referable to the construction of the alimentary canal, and to their phlegmatic temperaments. In these ruminants the stomach is quadrisected, is extensively lined with cuticular mucous membrane, and as regards its first three divisions is less vascular and more mechanical than in man, dog, or horses in its action; hence vegetable poisons are longer in affecting the ruminant than these animals. The first and third compartments of the stomach always contain food, often in large quantities. These facts, as stated above, explain why cattle require such large doses of all medicines, why considerable quantities of irritant and corrosive poisons can be given them with comparative impunity, and why purgatives (unless

in large doses and in solution) are so tardy and uncertain in their action.

DISEASES.

The existence of disease modifies the action of medicines. A congested or inflammatory condition of the alimentary canal retards absorption, and the consequent activity of medicines given by the mouth. When excretion is hindered, medicines are usually retained longer in the system, and hence act more powerfully. Conversely, when excretion is active, as in diuresis, diabetes, or diarrhœa, many medicines (as opium, belladonna) and many poisonous agents (as rhododendron, etc.) do not manifest their full activity.

Habit.—Wood says that the continued use of certain medicines, the gradual eating of a poisonous herb, alters the degree of action. This is quite feasible. Virginian deer, by habit, are said to thrive on tobacco; some monkeys feeding on strychnine-containing nuts are said to become insusceptible to strychnine.

Further, most vegetable substances are liable to be modified by soil, climate, and cultivation. Medicinal plants are usually most active when indigenous, but to this rule the Opium Poppy and Tobacco are notable exceptions.

Species of Patient.—The several classes of veterinary patients are differently affected by many medicines. The differences are chiefly in degree rather than in kind, and depend upon variations in organisation and function. On the circulatory, respiratory, and ordinary systems, which nearly resemble each other in man and the lower animals, medicines act uniformly. Thus aconite, digitalis, and nitre produce very similar effects in man, horses, dogs, and cattle. Great diversity, however, occurs in regard to medicines acting on the nervous, digestive, and cutaneous systems, which differ considerably in the several species of animals. The more highly any organ, or system of organs, is developed, the more susceptible does it become to the action of medicines—and, it may be added, to diseases also. This general law explains why the highly-developed human brain is specially susceptible to the effect of such cerebral medicines as opium and chloral, and why frogs (whose spinal system is developed at the expense of their brain) are so susceptible to strychnine, which acts specially on the cord. The human cerebrum, the seat of intelligence, is more than seven times the weight of the mesocephalon and cerebellum.

In the domestic animals the cerebrum is about five times the weight of the posterior parts which regulate motor energy, while the cord is relatively larger than in man. This relative development explains how such medicines as opium, chloroform, and chloral cause in man blunted intellectual function and deep stupor, while in the

lower animals they produce deranged motor function and convulsions.

Lastly, with regard to the particular condition of the animal taking or receiving poisonous agents, we must remember the phenomena of (1) idiosyncrasy, (2) tolerance. Large quantities of most vegetable agents are necessary to exert a poisonous action on herbivora, and a small amount of animal poison is effectual; but there are marked exceptions, as in all other rules.

The phenomena of tolerance is the condition of becoming accustomed to the remedy, so that larger doses are required than at first to produce medicinal effects. Sometimes, however, agents are cumulative, so that successive doses at length simultaneously exert their action, and may thus destroy the patient. This results in the case of those agents which are not readily thrown off from the system by the excretory organs. We see this, for example, in digitalis, which only after several doses is removed by the kidneys. Certain diseases, too, may be confounded with poisoning; and it is a matter of fact that extreme difficulty occurs in some cases in making a correct diagnosis.

Leguminosæ.

Sub-Order Papelionaceæ.—This order contains a number of plants which are used as nutritious food by man or animals, such as Peas (Pisum), Broad Beans (Faba), Kidney Beans, Scarlet Runners and Haricots (Phaseolus), Lentils (Ervum), Pigeon Peas (Cafanus). The seeds of the above plants and many others are commonly known under the name of Pulse, and do not need any detailed description. Lucerne and Medick (Medicago), Melilot (Meliotus), Clover (Trifolium), Tares and Vetches (Ervum Vicia), Sainfoin (Onobrychis), and many others, are common fodder plants in various parts of the globe. Some plants, or plants of this sub-order, are, however, poisonous: as the roots of the Scarlet Runner (Phaseolus Multiglorous), the roots of Phaseolus Radiatus, the seeds of Lathyrus Aphaca, the seeds and bark of Laburnums (Cysticus Vulpinus), the seeds of Anagyris Focleda, the seeds of the Calabar Bean (Physostigma Venenosum), and it is also said by some (although denied by Macfadyen), the seeds of Obrus Precatorious, also the seeds of the Bitter Vetch (Ervum Ervilla), the juice of Coronilla Varia, the leaves of some Gompholobiums, the leaves and young branches of Tephrosia Toxicaria, the bark of the root of Piscidia Erythine, and the parts of some other plants of this sub-order.

This order supplies us with many useful plants, and many of the species are exceedingly beautiful. The Furze and Broom, Bean, Pea, Vetch, Clover, Trefoil, Lucerne—all staple articles of culture by the

farmer—are all species of the Leguminosæ. The Gum Arabic, Senegal, Kino, Senna, Tragacanth, and various other drugs, not to mention Indigo, the most useful of dyes, are products of other species.

There is this, however, to be borne in mind in regarding the qualities of this order from a general point of view: viz., that upon the whole it must be considered poisonous, and that those species which are used for food for man or animals are exceptions to the general rule, the deleterious juices of the order not being in such instances sufficiently concentrated to prove injurious, and being, in fact, replaced to a considerable extent by either sugar or starch.

Fodder poisoning due to eating clover contaminated by the Clover Fungi, *Polythrincium Trifolii* (*Splaeria Trifolii Pers*), has been recently encountered by Veterinary-Surgeon Kunz, Grosswangen (Lucerne), and recorded in THE VETERINARY JOURNAL, August, 1916; and Danimann, in his text-book on Hygiene, records cases of clover fungi poisoning similar to those mentioned by the above-named surgeon. Sudden staggering or rocking of the hindquarters, with paralysis of the jaws, was seen in some cases at the onset; in others, violent convulsions and symptoms of brain irritability were also noticed, with death resulting. *Post-mortem* appearances, those of gastro-enteritis, with inflammation of the spinal marrow, as the result of the intoxication being the cause of the disease.

These, I think, are about all the collective plants which afford cases of poisoning in the practice of English veterinarians, save for a few mushroom plants which cattle eat occasionally; but death, if resulting, is not recorded; or, at least, I have failed to find any mention in the many works I have consulted. The subject is a wide one and extremely interesting, and my records will, I hope, prove of some service, or a reminder of what one has to face and combat in practising our varied calling as veterinarians.

BOTANICAL NOTES.

The common potato, which is so largely used for food in temperate climates, is the tuber of S. Tuberosum. A decoction of the stem and leaves has been used as an alterative in cutaneous diseases, and an extract has been employed as a narcotic and antispasmodic. The medicinal properties of the potato plant are chiefly due to the presence of a small quantity of an alkaloid called solanin, which has narcotic properties. Solanin does not produce dilation of the pupil, like the alkaloids of the Atropaceæ, and hence the reason why the juice of the Solanaceæ generally differs in such respect from that of the Atropaceæ. Solanine has been detected in all parts of the potato plant, but in the tuber only traces are to be found.

Poisoning Produced by Potatoes.

Natural Order (*Solanaceæ*, or Potato).—Bissange has observed poisoning in bovines and pigs, due to the use of potatoes in nearly 800 cases. The cases are common in certain years by reason of the peculiar climatic changes that favour the conditions in the tubers. The changes are various: the potatoes may be frozen, sprouted, green, or spoiled; the parings and tops may also prove hurtful.

And his conclusions are as under:—

(1) Uncooked potatoes, even when sound, although they may produce an increase in the amount of milk secreted, ought to be given to milking cows in small quantities; they only irritate the digestive canal, and often determine a gastro-enteritis.

(2) Cooking brings out the nutritive qualities of the potato; it removes acidity, and partially destroys the harmful action of solanine.

(3) Frozen and diseased potatoes ought not to be utilised for feeding, because of the solanine contained. Moreover, they are poor in nourishment, the chief food principles having disappeared.

(4) Sprouted potatoes should not be used until all the sproutings are removed from the tubers.

(5) If the potatoes have become green, they should only be given in small quantities, and then only after they are cooked.

(6) Potato tops should only be used for litter, and should not be used for feeding purposes.

Whatever condition sets up the disease, the symptoms of poisoning are usually the same. At the onset there is loss of appetite, absence of rumination, muscular tremors, tottering gait, weakness of the hindquarters. Later there is violent diarrhœa; the dejections have a peculiar and strong odour; there is tympany in the left flank, ptyalism, and always papillary dilatation, causing a peculiar appearance of the animal, and which sometimes makes it easy to detect the affected animals in the stable. There is somnolence and, it may be, also vertigo.

The conditions last three or four days; the loss involved is serious, having regard to the loss of condition which follows, to the falling off of the milk supply, and to the abortions which sometimes occur. In the pig there are both vomition and diarrhœa, but recovery is more rapid.

Treatment, as followed by the author, consists in the administration

of tannin in doses of from 15 to 30 grammes daily. The tannin appears to neutralise the solanine which is not yet absorbed. Stimulants are indicated to ward off depression, and aromatics (coffee) were given and external stimulants applied. The author has made some experiments with solanine.

Fodder Poisoning,

Due to clover affected with the clover fungi Polythrincium Trifolii, Sploeria Trifolii (Pers), has been seen ; and Dammann, in his text-book of Hygiene, records cases of Clover Fungi poisoning similar to those recorded by Veterinary-Surgeon Kunth, Grosswungen (Lucerne). Sudden staggering or rocking of the hindquarters, with paralysis of the jaws at the onset, sudden in appearance. In some cases violent convulsions and symptoms of brain irritability. *P.-M.* appearances : Gastritis and inflammation of the spinal marrow, as the result of the intoxication being the cause of the disease.

Lastly, we deal with the natural order Papilionaceæ. The chief plant *Savin*, the fresh dried tops of Juniperus Sabina. *Natural Order* (*Coniferæ*).—By many this plant is not considered poisonous, but by others extremely so. Horses in particular have succumbed from eating of same, and in the carnivora it is extremely irritant. Abortion has also taken place in the mare Mellett (Henley-on-Thames, 1885) ; and its continuous use, according to this observer, destroyed unborn foals, causing their expulsion (experimentally employed).

It is occasionally used as an anthelmintic, but the *rationale* of this treatment in an enlightened age is questionable (Mahon). It acts violently on the kidneys and bladder, and should not be employed internally when so many agents are at our disposal in the present day.

Therapeutics.

Treatment in cases of poisoning comprises certain general principles of great importance. The poisonous action may be arrested, if we are called in and make our diagnosis in good time, either by preventing the taking up of the poison, or its irritant action on the tissues by intermingling it with mucilaginous matter. In the case of irritants this measure might be supplemented by dilution, but this only tends to promote absorption, and therefore is inadmissible in the case of those poisons which act from the blood. Administration of such bland and mucilaginous agents as white of egg, wheat flour and meal, or even of blood, should be one of the first measures resorted to in cases of poisoning through the alimentary canal. It has this advantage, that the albuminous matters, in some instances,

chemically unite with the poisons, and so convert them into harmless and insoluble agents. But this does not apply to a marked extent when one is dealing with vegetable poisons.

Take aconite poisoning; stomach pump; emetics; hypodermic injections of digitalin; stimulants; rectal injections of salt solution; hypo injections of strychnine.

(2) Belladonna; Pilocarpine (hypodermically); morphine solutions; stimulants and coffee; warmth.

(3) Croton beans; milk or olive oil; white of egg; linseed gruel; tea; opium to relieve pain.

(4) Conium (Hemlock), hypodermic injections of strychnine; warmth and stimulants; nux vomica tincture and olive oil.

(5) Digitalis; Tannin, 3 to 12 ozs. water; strong tea and coffee; caffeine salicylate (hypodermically).

Stimulants: Spts. Aether, Nit. Liq. Ammon; Acetatis; aconite to control rapidity of heart beat.

Fungi (poisonous) *Muscarine.*

Purgatives: Castor oil; stimulants; atropine sulphate (hypodermically); tobacco; stimulants; warmth; hypo injections of strychnia sulphate.

The general treatment therefore appears to rest on "the sheet anchor," so-called, of stimulants and oleaginous purgatives, with intravenous injections of saline solution. Brandy, ether, and strychnine hypodermically form our most reliable and powerful stimulants. Well rug the patient; stimulate the extremities. In the case of a horse, well bandage, hand rub, and repeat every few hours.

As regards feeding, this is very often out of the question, and resort has to be made to oral or rectal administration of nutrients; and in the horse and dog especially I have used these.

I again beg to refer to poisonous fodder, and to record a bad attack in five horses in 1893, when practising in North London, when I administered vinegar and water with whisky (2 ozs. vinegar, 1 pint water, 2 ozs. whisky) to each horse every four hours; gave strychnia hypodermically, milk to drink, linseed tea, and saved my patients. The hay was mouldy and had been placed on the stable floor as bedding. What morbid state of the appetite induced the horses to eat hay is beyond me. Abdominal pain was combated by Tinct. Opii, and in a few cases my old friend "Chlorodyne."

During my service on H.M.S. *South Africa* I encountered a few cases in Hungarian horses on the Transport "Anglo-Canadian." Here I gave warm salt water, and the horses speedily recovered. I do not know whether this treatment would answer, however, in every case, but it

did here, and one had not the pharmacy of old England to fall back upon. Anything likely to suit the cases was the order of the day.

Hawthorn Poisoning.—Several cases are recorded by Mr. Alfred Marston, M.R.C.V.S., Winforton, Herefordshire, November, 1898, *Veterinarian.* Impaction of jejunum, enteritis, rupture of the stomach, and death in many cases.

Common Laurel.—Natural Order, Rosaceæ ; Sub-order, Duperaceæ (Amygdalae).—The leaves, bark, and fruit of Prunus Lauro-Cerasus (the common Laurel, or Cherry Laurel) are poisonous ; their poisonous properties are due to the production of volatile oil, containing hydrocyanic acid when they are moistened with water. As the leaves, etc., are bitter, any animal, if water is available—as it often is at pasture—would drink heavily, and thus aggravate the conditions, leading to constitutional disturbance, and death.

Lobelia Inflata.—Indian tobacco resembles tobacco in its action. Several fatal cases of poisoning have occurred in the United States and in this country from its empirical use.

Almond, Amygdalis Communis, Var Amara.

Sub-order, Chrysosbalandæ ; Natural Order, Rosaceæ.

A. Persica (Peach Tree). The flowers, bark, etc., possess poisonous properties, owing to the formation of hydrocyanic acid.

Lastly, I refer to poisonous fungi, the chief of which is the Agaricus muscarious. Muscorine was discovered by Schmiedeberg and Koppe. Neurine and chlorine also are toxic, and derive additional interest from their close resemblance to muscarine. Chlorine and neurine are the toxines found in undecorticated cotton cake, and which killed several milch cows.—*Veterinarian*, December 1898, p. 675—cases being those recorded by Mr. James Peddie, Dundee. These toxines are antagonistic to atropine, so far as relates to their action on the heart and glandular system. Halliburton, in "Schafer's Text-Book of Physiology," 1898, refers to these actions.

Again, Amanita (Agaricus Muscaria) is a very poisonous species of fungi. It possesses narcotic and intoxicating properties, and is much used in Kamschatka and other parts of the Russian Empire as a narcotic and intoxicating agent. This fungus possesses the remarkable qualities of rendering fluid the excretions of those who partake of it. When steeped in milk, etc., it acts as a poison to flies ; hence its specific name. Undoubtedly it would cause serious disturbance in cattle, and experiments would go a long way to prove this (Mahon).

Careful research into all known "vegetable poisons" is herein tabulated, and I must offer my apologies for the length of a too-neglected and very often overlooked study in the practices of the veterinarian—viz., Toxicology. In my student days I (with a few

surviving veterinarians) had tuition from the late Dr. T. S. Cobbold, M.D., lecturer in Helminthology, who also lectured to us on botany, and in our excursions around the country pointed out, collected, and distributed specimens, which many of us kept. A few of us, no doubt, pursued the study of poisonous plants in later years. Poisonous plants furnish baffling and interesting cases for us. We treat the cases and suspect the poison, but too often we do not discover its source.

Clinical Cases.

PUNCTURED WOUND OF THE HOCK IN A CART MARE.

By G. MAYALL, M.R.C.V.S.

A BLACK cart mare, 7 years old, was kicked by her next stall neighbour on November 21st. I was called in to see her on the morning of November 24th, she having been working in the interval. I found a punctured wound on the outside of the near hock discharging blood and pus. The hock was clipped, the wound cleansed, and I injected it with a strong solution of iodine, and left instructions for this to be done three times daily. The next day the mare was very lame. A dose of physic was given, and the injections continued. The discharge was still profuse, and the mare showing increased pulse and signs of pain. On the following day the state of the subject was slightly improved—she was not so lame, and there was a slight decrease in the discharge. Briefly, the patient remained in about the same condition until December 2nd, when she was taken to another stable where cold water irrigation of the hock joint could be carried out for half an hour three times daily, and she could be conveniently slung. At this time, too, injections of Lugol's solution and glycerine (Lugol's solution 1 part, glycerine 4 parts) were syringed into the wound three times daily, the mare being kept on laxative diet and given laxative medicine at frequent intervals. She remained in slings until January 8th, and the irrigations and injections were discontinued on January 2nd, and one of Burroughs Wellcome's Enule corrosive sublimate bougies (gr. 1-25th) was inserted into the punctured wound twice daily from the 2nd to 8th of January. On January 10th she was put to work, and has done well since.

In the October issue of the JOURNAL for 1916, at page 340, I recorded a case of open joint in the horse treated on similar lines to this case. To those who have not yet tried injections of Lugol's

solution and glycerine for open joint and punctured wounds of joints a trial is recommended, and a record of their experiences will be esteemed. At the same time, where cold water irrigation can be carried out by means of india-rubber tubing connected to a tap so that a continuous stream can be directed on to the lesion and the joint, so much the better.

THE OPERATION OF GASTROTOMY AND ENTERECTOMY UPON THE DOG.

By CANIS MAJOR.

THE patient was a Scottish terrier, 2½ years old, having been under treatment by my locum during my absence from home for interdigital abscess. The case had been a particularly troublesome one, the treatment surgical, whilst the resulting operative wounds were difficult to heal. The owner soon afterwards, on taking a holiday and the dog with her, had occasion, owing to the dog becoming so poorly and so emaciated, to seek further advice. The diagnosis revealed that the dog was suffering from a septic poisoning resulting from being allowed to lick the operative wounds over a long period.

Upon the owner returning, the dog was brought for my inspection. I was surprised to observe his impoverished condition, the history of the frequent vomition leading me to make a careful manipulative examination of the abdomen, when the presence of a hard substance could be detected, which I concluded must be a foreign body. Upon mentioning my suspicions to the owner it was remembered that in May of last year he had been given an imitation rubber bone to play with, which he had torn up, swallowing several pieces, and rejecting again what the owner thought was the whole amount swallowed; at any rate, not the slightest suspicion was entertained of the retention of any part; in fact, the matter had been quite forgotten.

An operation was suggested and agreed upon, and carried out upon October 28th, 1916, under strictly aseptic precautions. The prepubic area was chosen, the hair shaved over a considerable area, washed with disinfectant liquid soap, and the lines intended for incision painted over with Tincture of Iodine. All instruments having been previously sterilised, an incision 3 inches in length was made through the skin, and the subcutaneous fat removed to facilitate operation; next the abdominal muscles, and lastly the peritoneum were incised. Digital exploration disclosed the presence of the foreign body in a forward direction—in fact, in the stomach. Some difficulty was experienced in bringing this organ *in situ*, the patient having to be raised by the shoulders for this purpose.

A clean piece of linen, previously sterilised, with an aperture corresponding in size to the operation wound, was laid over the part, and the stomach brought through the aperture and laid upon it, when the foreign body was easily seen, and, in fact, seemed to be almost the only contents of this organ. An incision was now made through the least vascular parts, and at the broad end of the substance, and by exercising a little pressure the foreign body—a piece of india-rubber—was evacuated. The serous coat of the stomach was now carefully cleansed with tampons of sterilised cotton-wool and the iodine solution, six sutures of strong catgut inserted through the serous and muscular coats, the abdominal muscles similarly sutured, whilst silk was used for completing the suturing of the skin, the operation area, well dried, coated over with collodion, a pad of cotton wool, and bandaged.

The anæstheties employed *were* 1 grain of Morphine Hydrochlor subcutaneously about half an hour before preparing the operation area, and chloroform slowly administered during its performance.

This being the first gastrotomy I had undertaken, I was agreeably surprised next morning to find my patient in such fine form, all effects of anæsthetic and anticipated shock of the operation having passed away: in fact the greatest difficulty was experienced in keeping the animal quiet, he being of rather an excitable and bellicose temperament, desirous of strafing any of his species in the near vicinity, and was only rescued with difficulty from an Airedale whom he had attacked. He remained in my infirmary for one week from the date of operation, the owner wishing to nurse him at home. The wound healed by first intention in about ten days, and scarcely troubled him; appetite ravenous, no variation in temperature, nor apparent constitutional disturbance. From the date of his discharge, November 3rd, to the 9th, I attended him twice daily, and left him then to the care of his owner. On December 27th I was again consulted, as he began to display the same symptoms as before, viz., evidence of pain by extending the body, stretching out the neck, and rejecting food given to him, whilst the appetite was abnormal, seeking anything of an edible nature within his reach, and even devouring his own excrement. Palpation of the abdomen again revealed the presence of a foreign body further back, and a second operation was requested and carried out upon January 6th.

The same procedure was adopted with regard to anæsthesia—viz., 1 grain of Morphine Hydrochlor about half an hour prior to operation, the flank on this occasion being chosen as the site; hair shaved over a considerable area, instruments sterilised, and the line of incision painted over with Tincture of Iodine. Next the slow administration of chloroform, and the skin, abdominal muscles and peritoneum incised.

It was with some difficulty that the foreign body was located and brought to the surface of the operative wound, and in this case it was present in the bowel. As small an incision as possible was made and the foreign body, again a piece of rubber about the size of a Brazil nut. The bowel in this region was found to be very much thickened and œdematous, and much to my chagrin would not retain the catgut sutures; in fact, after several vain attempts to suture same, I most reluctantly allowed the animal to pass away.

It subsequently occurred to me that I might have passed it gently along the bowel to within reach of the rectum, but the *post-mortem* revealed the futility of such a procedure, the affected portion of the bowel found to be the ilium, the great length of bowel to be treated, and the narrow exit from that to the cœcum; so unfortunately terminated what would have been, except for the second obstruction, a very successful case. During the period between the two operations there was an alternate increase and decrease in weight of the animal, one week gaining three or four ounces, and the following week relapsing into the former state.

The symptoms displayed were peculiar, and some rather amusing, prior to and following upon the first operation—suddenly pulling up after movement, planting the forefeet straight out, extending the body and elevating the head. In this position he would remain for about thirty seconds, afterwards resuming his walk, and later going through the process again. His appetite was abnormal, even devouring his own fœces, and whilst on his walk in the garden would rush at, seize and devour any small object resembling food, even small pieces of crumbs thrown out for the birds.

It is interesting to mention that the mode of suturing employed for the operation of gastrotomy was interrupted sutures of strong catgut, one line only through the serous and muscular coats bringing the edges into apposition, and not by Lembert's method. Upon examination of the stomach after *post-mortem* the site of operation could not be detected, so perfectly had union taken place, and it was only with great difficulty that it could be traced upon examining the interior of this organ.

Since writing up the history of this case I was called in to see an Airedale, said to have been ailing for several weeks, losing flesh, and suffering from vomition, and upon my visit going through exactly the same performance as the preceding case—extending the forelegs, elevating the head, etc. Digital exploration revealed a hard substance in the intestine, well back. Enquiries elicited the fact that he was very keen in running after stones, and that he was daily kept busily employed in this manner at a neighbouring hospital, where the con-

valescent wounded soldiers continually humoured him at his favourite pastime, and where he was a great pet with them. The owner decided not to have an operation, but to trust to Nature. I have since heard from him that the dog has much improved, so it is possible that the offending object has passed away.

Laparotomy upon the Cat.

A so-called Persian cat, a great favourite, said to be suffering from obstruction of the bowels, and having been dosed with the usual nauseating household remedy—castor oil—without improving in any way, was brought to my surgery. Thinking perhaps from the odour accompanying it that it was matted behind, I first examined this region, when I discovered protruding from the rectum a piece of thread about three inches long. Slight traction failed to remove it,when I recognised the fact that a needle might be its fellow. Digital examination of the abdominal muscles, together at the same time with traction on the thread, proved this to be correct.

Operation was decided upon, and carried out as in the preceding case, the point of the needle being found to have penetrated the intestine, directed backwards towards the pelvis, and here penetrated the pelvic region.

With forceps it was extracted and removed together with the thread. For three weeks the cat remained in my infirmary in a very precarious condition, endless trouble being caused by the formation of pus within the wound, and it was only by frequent irrigation with a solution of hydrogen peroxide that at last it was overcome. The cat returned home before the wound was quite healed, and the result proved quite satisfactory.

CASES OF PRURITIC DERMATITIS CAUSED BY INFECTION OF MANGE FROM THE KITTEN.*

By A. WHITFIELD, M.D.

Cases of transference of diseases of animals to human beings have always a somewhat special interest, and in this short series of cases, there is also a rather curious coincidence.

On March 10th, 1916, a gentleman developed a pruritic eruption; he consulted a well-known dermatologist, who made the diagnosis of scabies and treated him with success. On June 20th his wife's maid developed a pruritic eruption, and a few days later his wife herself became affected with a somewhat similar eruption. Shortly after this one of the children who had been staying in the country came to town

*From the Proceedings of the Royal Society of Medicine (Vol. X, No. 2).

and developed an eruption after her return to the country. The doctor who attended the family was puzzled by these cases, for although the method of spread suggested scabies he was unable to recognise the eruption as such. He therefore brought the lady and her maid to me for my opinion.

When I saw these two patients their condition was as follows: The lady had a patchy eruption of small papules, about a millimetre in diameter, surrounded by an oval zone of erythema and in some instances surrounded by a minute pin's-head sized vesicle or serous crust, the resulting lesions being not unlike those of varicella on a very small scale. These lesions were never very closely aggregated, but were in rough groups, so that the individual lesions occurred about ½ in. from each other, and then there would be a large area of unaffected skin, about 8 ins. long, and then another rough group of lesions. The distribution was over the forearms, the upper arms, the thighs, the breasts, but not the nipples; and over the abdomen and the scalp, but not the face. The fingers and the wrists were free. In the maid the lesions were precisely similar, but the scalp was not affected. Pruritus was intense, but was not specially worse at night.

The appearance of the eruption immediately suggested to me mange caught from the dog. I have been lucky enough to see a large number of cases of this, and I asked if the patient had a dog. She replied in the negative, but stated that they had a kitten, which scratched a good deal. We therefore sent for the kitten, and as I found it rather scurfy, especially behind the ears and on the face, I removed some of the scales and put them under the microscope. I was lucky enough to find both the acarus and a run, including eggs and fæces, in one of the earlier specimens. The kitten was chloroformed on the spot, the patients were put through a mild form of treatment for scabies, and I have since heard that there has been no recurrence of the disease.

The first point that suggests itself at once is: What was the nature of the original attack in the husband? I have no doubt that this was ordinary scabies, since he developed his eruption on March 10th and the kitten was not born until about May 14th—*i.e.*, about two months after the husband was affected. This seems to me to be a rather curious coincidence, since two different acarine infections in the same family within three and half months must be very uncommon. Moreover, if it had not happened that the animal in question was so very young, one would never have been certain that the disease in the husband was not of the same nature. Lastly, although mange caught from the dog is certainly far from rare, this is the first instance in which I have identified the infection as coming from the cat. I would say in passing, that I regard infection with mange from the

dog as common, and with ringworm as rare; while from the cat the infection with ringworm is common and with mange rare.

I only remember seeing one outbreak of mange in cats on any large scale, and this was due to the exceptional opportunities of studying skin disease in animals that I have had for some years owing to the kindness of my friend Professor Hobday. In this instance the disease ran through a valuable cattery of chinchilla Persians, and either the disease or my too enthusiastic treatment resulted in the death of about four hundred pounds' worth of cat. I found the acarus likewise in the samples of cat submitted to me on that occasion, and it was very much smaller and not quite of the same shape. On looking up this question I find that the cat suffers from two forms of acarus, one almost indistinguishable from the ordinary parasite of human itch, but now believed to be a distinct variety; and a second known as sarcoptes minor, which usually causes the death of the host. I have no doubt that the very small, peculiar shaped acarus that I obtained in the chinchilla epidemic belonged to this variety, and may have been responsible for the high mortality rather than my treatment.

It interested me to find the extremely superficial position of the run in this kitten; it is in no sense a burrow, but rather a pathway among the scales. Hence the name occasionally given to it of "acarus squamosus." It appears that the position of the acarus and runs in scabies norvegica, which I have not seen, is somewhat similar.

DISCUSSION.

Dr. S. E. DORE: I should like to ask if Dr. Whitfield regards this acarus as the human acarus. Fantham, Stephens, and Theobald, in their book on "The Animal Parasites of Man" (pp. 510–521), state that the human acarus can be artificially transmitted to horses, dogs, and monkeys, but not to cats. The sarcoptes minor, however, which infects cats and rabbits, causes in man an eruption lasting about a fortnight. I take it that it is more likely to be the small acarus in this case than the ordinary human acarus.

DR. WHITFIELD (in reply): This is not the small acarus; I do not think it is the human acarus. I looked up the book mentioned a few weeks ago, and it is there stated that all these animal acari are distinct. But the sarcoptes minor is much smaller, and is not quite the same shape.

[Having suffered from scabies caught from a cat and diagnosed by the late Dr. Morse, of Norwich, and myself, I, for one, am convinced that mange of the cat is communicable to man. The scabies, in my case, extended from the right wrist to the shoulder and was cured quickly by the application of ordinary sulphur ointment. Two military friends of mine have recently suffered from what has been diagnosed as scabies, presumably contracted from the horse.—G. M.]

Abstract.

THE FACTORS UPON WHICH THE EFFECT OF DISINFECTANTS DEPEND.

By Professor WALTER FRIE, of Zurich University.

The effect of our disinfectants is conditional upon their constituents and properties and those of the milieus and bacteria they are brought in contact with. Shortly, the action of disinfectants depends:

I.—(*a*) On their chemical constituents, structure and properties.
(*b*) Physical and physico-chemical properties.
1. Degree of dissociation.
2. Solubility in water and elements of the bacteria.
3. Colloid condition in concentration.

II.—*Medium*:
(*a*) Dissolving power of the disinfectant and influence of the same—associability with the solution.
(*b*) Internal trituration.
(*c*) Third substances which influence the disinfectants, the medium or the bacteria.

III.—*Bacteria*:
(*a*) Largeness or minuteness of the same—extent of its outside surface.
(*b*) Colloid condition—Soakability and fitness for precipitation:
1. Of the membrane.
2. Of the protoplasm.
(*c*) Chemical constituents, structure and properties.

As a further factor to be considered is:

IV.—*Temperature.*

That we do not gain satisfaction from present-day disinfectants is clear. The ideal disinfectant—that with the merit of enormous bactericidal power—possesses the advantages of great cheapness, easy solubility and handiness in water, only slightly toxic for animals, united with unlimited strength, and, if possible, lacking also in smell, is not yet found.

Finally it must be remarked that the study of disinfection is not complete without a clear understanding of the life and death conditions and phases of micro-organisms, and a further survey shows us that a knowledge of the life and death of cells of higher organisms, especially of hæmolysis, necrosis, and of intoxications is also necessary. In this connection the teaching of disinfection must call to its aid the sciences of physiology, general pathology, pharmacology and toxicology.—*Swiss Journal of Veterinary Medicine.* G. M.

Translation.

THE INTRA CUTANEOUS TUBERCULIN TEST ACCORDING TO ES AND SCHALK AS A DIAGNOSTIC IN FOWL TUBERCULOSIS.

By JAKOB and GAZENBECK.

These authors examined twenty-four hens, of which sixteen proved tuberculosis, and eight free from tuberculosis. They employed

50 per cent. avian tuberculin. The healthy fowls all gave a negative reaction. Of the sixteen tuberculosis subjects, eight gave positive, two doubtful, and six negative reactions. These last were intensely tuberculous and emaciated, and could already be recognised during life as badly affected with tuberculosis. Slight, and in a small degree, affected cases of the disease could be diagnosed by the intra cutaneous reaction even at a stage when the hens seemed apparently healthy, and on account of open intestinal tuberculosis were a source of great danger to surrounding life. The authors, on this account, consider the method as a good diagnostic procedure for the early recognition of tuberculosis in fowls (according to Leevwen, Bern Dissertation, the intra-cutaneous test in fowls gives gratifying, if not wholly successful, results).—G.M., *Swiss Veterinary Journal.*

Review.

THE CARE OF THE HORSE AND MULE, AND HOW THE HARNESS SHOULD FIT—with 27 illustrations. Compiled and illustrated by R. J. Day, Lieut., The Machine Gun Corps. For the Guidance of Officers in training for Transport Officers and horsemanship; price 2s. net. Published by E. J. Day & Co., 6, Gerrard Street, London, W., 1916.

At a time like the present, when many novices have enlisted with horse regiments, there is plenty of room for a short and plain manual dealing with the care of horses and mules, and the proper fitting of their trappings. Mr. Day has produced a very handy little book which neither errs in being too verbose nor too laconic. It contains all that the horseman requires to know as regards the essentials of an intelligent comprehension of his duties as they affect his charge It will familiarise the new recruit with terms in horse jargon which, without an explanation, will be more or less double-Dutch to him, and to the man who thinks he knows all it will be a valuable guide if he is only humble enough to accept its teaching. Horses and mules will always be needed for many of the guns, and for transport work, and a book devoted to this phase of military work is eminently desirable. The book has been written more especially for those in the Machine Gun Transport, but it will be quite as useful to all mounted officers. The points of the horse are plainly illustrated by diagrams and illustrations, and the correct fitting of bridle, saddle and harness is described and delineated. There are short sections on grooming, the position of ailments, watering and feeding, duties of a transport officer, and killing a horse humanely.

We do not quite see the force of calling the part indicated at 9 on Plate 1 " the jaw." We would rather call it " the cheek," and in any case it is only one jaw. The point at 26 is " chestnut," and not " Chest Nut." Splints at page 32 are said to be hereditary, or due to external violence or strain. We think that perhaps in 70 per cent. of cases they are due to concussion. A horse having wind-galls is said to show " use "; we think " wear " is a better term.

Mr. Day has produced a very valuable little manual, attractively bound, that is worth far more than the small sum of 2s. asked for it. It deserves to be, and we trust it will be, found in the hands of all transport officers and mounted men desiring to be well up in the technique of their duties.

A handy, durable and serviceable atlas, illustrating the points of the horse, accompanies the book at the price of 9d. extra, and is well worth study. It contains a description of the markings of the head, which is the first we have seen in print. By means of it the mysteries of " race " and " snip " are explained, but we miss any reference to our old friend " snitch."—G.M.

MENTIONED IN DISPATCHES.

Mentioned in Sir D. Haig's despatch for distinguished and gallant services and devotion to duty.

Anderson, Temp. Capt. W., M.B.; Bambridge, Capt. W. J., Spec. Res.; Bone, Capt. H.; Chown, Capt. H.; Clunes, Temp. Capt. F. L.; Davies, Capt. D. G.; Fox, Capt. J., Spec. Res.; Hobday, Temp. Maj. F. T. G., F.R.C.V.S.; Hogg, Capt. F.; Howard, Lt. P. S., F.R.C.V.S.; Huston, Capt, P. D., Spec. Red.; Ives, Temp. Qrmr. and Hon. Lt. J. F.; Lake, Maj. B. L.; Lalor, Capt. A. G.; Laurie, Temp. Capt., J. H.; Nicholas, Capt. A. V., Spec. Red.; O'Donel, Capt. S.; Porteous, Capt. R.; Slocock, Capt. S. L.; Walker, Capt. (temp. Maj.) W. H.; Webb, Maj. E. C., F.R.C.V.S.; Weir, Temp. Capt. F. J.; Williamson, Capt. D. R., Spec. Res.; Wright, Capt. J. H.; Anthony, Capt. H. L.; Finch, Capt. R. (N.Z.A. Vety. Dpt.); Foster, Capt. A. N., F.R.C.V.S.; Fletcher, Capt. S.; MacDonald, Capt. M.

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